

DIN EN ISO/IEC 80079-38:2017-10 (E)

Explosive atmospheres - Part 38: Equipment and components in explosive atmospheres in underground mines (ISO/IE C 80079-38:2016)

CONTENTS

EUROPEAN FOREWORD.....	5
FOREWORD.....	6
INTRODUCTION.....	8
1 Scope.....	10
2 Normative references.....	10
3 Terms, definitions and abbreviated terms	11
4 Requirements for equipment (machines) and components	15
4.1 General.....	15
4.2 Ignition hazard assessment	16
4.2.1 Formal analysis.....	16
4.2.2 Assessment for equipment-group I, EPL Mb	16
4.2.3 Establishing the maximum surface temperature	16
4.2.4 Dust deposits and other material in the gap of moving parts.....	16
4.2.5 Ignition hazard assessment report	17
4.2.6 Ignition sources	17
4.3 Non-electrical equipment and components.....	17
4.4 Electrical equipment and components.....	17
4.4.1 General	17
4.4.2 Electrical equipment protection.....	18
4.4.3 Over-current protection	18
4.4.4 Earth-fault protection.....	19
4.4.5 Mechanical protection of live parts.....	20
4.4.6 Electric cables that are part of the equipment	20
5 Additional requirements for specific equipment and components.....	21
5.1 Cutting and stripping equipment	21
5.1.1 General	21
5.1.2 Machines with cutting picks	21
5.1.3 Stripping machines	22
5.2 Rope haulages for level and inclined transport.....	22
5.3 Fans	22
5.3.1 Ventilating fans for use in underground parts of mine.....	22
5.3.2 Other fans.....	24
5.4 Internal combustion engines	24
5.5 Air compressors	25
5.6 Drilling equipment and components	25
5.7 Brakes	26
5.7.1 Brakes used only for stopping in emergency	26
5.7.2 Service brakes (including friction brakes and fluid based retarders).....	26
5.7.3 Parking brakes.....	26

5.8	Traction batteries, starter batteries and vehicle lighting batteries.....	26
5.9	Optical fibres used on machines and electromagnetic radiation from components on machines	27
5.9.1	External pipes/optical fibres	27
5.9.2	Radio-frequency radiation from equipment.....	27
5.10	Gas monitoring systems	27
6	Fire protection	28
6.1	General.....	28
6.2	Non-metallic materials.....	28
6.3	Hydraulic and pneumatic equipment	28
6.4	Requirements for cable-reeled equipment.....	30
6.4.1	General	30
6.4.2	Special requirements	30
6.5	Fire prevention on electric cables that are part of the machine	30
6.6	Conveyor belting	30
7	Information for use	31
7.1	Signals and warning notices	31
7.2	Instructions	31
7.2.1	Information on use	31
7.2.2	Information on maintenance and repair.....	31
8	Marking	31
Annex A (informative) Example of an ignition hazard assessment for a conveyor belt intended for use in a coal mine.....		33
A.1	General.....	33
A.2	EPL and intended use of the equipment.....	33
A.3	Construction and description of the equipment.....	33
A.4	Assessment	34
Annex B (informative) Example of an ignition hazard assessment for a shearer loader intended for use in a potentially explosive atmosphere of a coal mine		37
B.1	General.....	37
B.2	EPL and intended use of equipment	37
B.3	Construction/description of the equipment with regard to ignition protection.....	37
B.4	Ignition control and monitoring system.....	38
B.5	Compliance with the basic methodology and requirements in ISO 80079-36	38
B.6	Ignition hazard assessment of the electrical parts of the equipment.....	39
B.7	Ignition hazard assessment of non-electrical ignition sources	39
B.8	Equipment marking	39
Annex C (normative) Ignition sources		43
C.1	Hot surfaces	43
C.2	Flames and hot gases (including hot particles).....	43
C.3	Mechanically generated sparks.....	44
C.4	Electrical equipment.....	44
C.5	Stray electric currents	44
C.6	Static electricity.....	45
C.7	Lightning.....	45
C.8	Radio frequency (RF) electromagnetic waves from 10^4 Hz to 3×10^{12} Hz (high frequency).....	45

C.9	Electromagnetic waves from 3×10^{11} Hz to 3×10^{15} Hz	46
C.10	Ionizing radiation.....	46
C.11	Ultrasonics.....	46
C.12	Adiabatic compression and shock waves	46
C.13	Exothermic reactions, including self-ignition of dusts.....	47
Annex D (informative)	Guidance on potential risks for converter-fed motors	48
Annex E (normative)	Tests for surface protective coating for group I hand tools of EPL Mb	49
E.1	Incendive impact tests in explosive mixture.....	49
E.1.1	Verification of ignition of the raw light alloy material.....	49
E.1.2	Estimation of protective coating efficiency	49
E.1.3	Evaluation of results.....	50
E.2	Adhesion test of the protective coating	50
Annex ZA (informative)	Relationship between this European Standard and the Essential Requirements of EU Directive 2014/34/EU	52
Annex ZB (informative)	Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC	54
Annex ZC (informative)	Significant technical changes between this document and the previous edition of this European Standard	55
Bibliography	57
Figure B.1	– Layout and construction of the coal face shearer loader	38
Figure E.1	– Rig for impact ignition test.....	51
Table 1	– Combination of materials	24
Table 2	– Limit values for hydraulic fluids	29
Table A.1	– Example of an ignition hazard assessment for a mining conveyor, EPL Mb (1 of 2)	34
Table B.1	– Example of an ignition hazard assessment for a shearer loader, EPL Mb (1 of 3)	40